

## A New Species of *Lithophaga* (Bivalvia) from the Great Barrier Reef, Australia

BY

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(2 Plates)

### INTRODUCTION

DURING 1974 I STUDIED the ecology of burrowing bivalves (terminology after CARRIKER & SMITH, 1969: 1011) at the Great Barrier Reef (GBR), where I found 5 *Lithophaga* species restricted to live coral (cf. OTTER, 1937; IREDALE, 1939). One of them is an undescribed species. The species are:

- Lithophaga lessepsiana* Vaillant, 1865
- Lithophaga lima* Lamy, 1919
- Lithophaga hanleyana sensu* Gohar & Soliman, 1963  
(non Reeve, 1857)
- Lithophaga simplex* Iredale, 1939
- Lithophaga kuehnelti* Kleemann, spec. nov.

### DESCRIPTION OF THE NEW SPECIES

#### MYTILOIDA

##### MYTILACEA

##### MYTILIDAE

##### Lithophaginae

- Lithophaga* Röding, 1798  
(*Leiosolenus*) Carpenter, 1857

*Lithophaga* (*Leiosolenus*) *kuehnelti* Kleemann, spec. nov.  
(Figures 1c, 2)

Named in honor of Wilhelm Kühnelt with regard to his "Bohrmuschelstudien" I, II, and III (1930, 1933, and 1942, respectively).

**Holotype:** BM(NH) Reg. No. 1976135; size: length, 28.4 mm; height 9.0 mm; breadth 8.6 mm (Figure 1c).

**Paratypes:** NHMW 80635 (dry), NHMW 80636 (formalin), Vienna, Austria.

**Type Locality:** Heron Island (Lat. 23°27'S; Long. 151°55'E), Capricorn Group, GBR, Queensland, Australia.

**Description:** Shell small, thin, fragile, translucent, and smooth. Periostracum pale-yellowish, covered by more than one type of calcareous matter. The soft paste-like, non-adhesive deposits are on the dorsal part of the shell as well as on the corresponding part of the burrow. On the ventral part of the burrow, which is free of calcareous deposits, in a few cases a very fine longitudinal ridge can be observed, where the byssus is attached (this species does not rotate). Ventral margin straight, dorsal margin almost parallel; umbonal parts not quite at the anterior end, causing a slight depression in the lateral outline, otherwise both ends of shell rounded. The characteristic feature is the incrustation of the posterior ends of the valves, which is adhesive, rather hard, smooth, thickening towards the ends, and slightly protruding beyond them, where it generally terminates in a conspicuous manner, similar to concave lips of a mouth (Figure 2). Due to the individual position of the orifice on the coral surface and the angle of the burrow, these lips are modified and rarely equal on both valves of a specimen.

**Habitat:** *Lithophaga kuehnelti* occurs in *Acropora* (*Isopora*) *palifera* (Lamarck) (Figure 3) at various sites off Heron Island and One Tree Island, both in the Capricorn Group, GBR. Host corals from well exposed sites (in terms of water movement) may be crowded by *L. kuehnelti*, without showing any harm (cf. WOOD-JONES, 1910: 127). An encrusting *A. palifera* (25×15×9 cm)

from One Tree Island contained 150 specimens as well as 34 barnacles.

**Distribution:** At the GBR the species is common in the subtropical part at Heron Island, One Tree Island, and Wistari Reef, all 3 in the Capricorn Group, and less common to rare at the tropical Lizard Island. The local distribution pattern seems to be related to the water movement, but not to the available surface area of the host coral (KLEEMANN, in prep.). In the bivalve collection of the BM(NH) there is a sample of *Acropora (Isopora) palifera* collected by J. D. Taylor from Addu Atoll, Maldive Islands in May 1975 with 12 specimens of *Lithophaga kuehnelti* still in their burrows and 4 loose specimens (BM[NH] Reg. No. 1976134). In the coral collection of the British Museum (Natural History), the following samples contain *L. kuehnelti*: BM(NH) Reg. No. 1892.6.8.50 and 51, both *A. palifera* from Capricorn Islands, GBR; BM(NH) Reg. No. 1887.1.29.5, *A. palifera* from New Guinea; BM(NH) Reg. No. 1884.12.11.17, *A. palifera* from Shortland Island, Solomon Islands. Other samples of *Acropora-Isopora* were found infested by *Lithophaga*, but without breaking up the corals I could not tell with certainty if the burrower was indeed *Lithophaga kuehnelti*.

#### COMPARISON WITH OTHER SPECIES WITH WHICH IT COULD BE CONFUSED

With the conspicuous posterior incrustation present, *Lithophaga kuehnelti* can easily be distinguished from other small *Lithophaga* species, such as *L. lessepsiana* Vaillant, 1865 (Figures 1d, e; 4 a-d), with which it sometimes occurs in *Acropora palifera*. *Lithophaga lessepsiana*, described from *Stylophora pistillata* by VAILLANT (1865:

124) can be regarded as the first record of *Lithophaga* from live coral, although not actually stated as such. *Lithophaga kuehnelti* can be distinguished from *L. hanleyana* Gohar & Soliman, 1963 by the differences in the patterns of their posterior incrustations (Figures 2, 4, 5). Without its incrustation, *L. kuehnelti* is very similar to *L. simplex* Iredale, 1939; this species was determined with reference to Australian Museum Reg. No. C. 105340 (part), as neither the type nor the paratypes could be investigated. The description and figure of *L. simplex* (IREDALE, 1939: 421; plt. 6, fig. 25) are inadequate and I consider it worth while to give more details and figures.

*Lithophaga (Leiosolenus) simplex* Iredale, 1939

(Figures 1b, 6a - 6d, 7)

= *L. cumingiana* Otter, 1937, not Reeve, but only as described from living *Favia* (BM[NH] Reg. No. 1952.1.29.845-854; one specimen of this lot is shown in Figure 6a).

**Description:** Shell thin, fragile, translucent, smooth, with faint growth lines. Periostracum pale-yellowish (colour of the living animal yellowish fluorescent green, except the chalky layers). No real incrustation, but fine, thin, very smooth chalky layer, sometimes covering the whole surface, rarely completely absent, but more often showing bare areas; no tip or prolongation of the posterior end (Figure 8). Collected specimens reaching 32.4 mm in length. The shell has a straight ventral margin, the dorsal margin is generally angulated (Figures 6a to 6c), but is sometimes almost parallel to the former (Figure 6d). The position of the dorsal angulation is in most cases slightly anterior, rarely posterior to the middle of the

#### Explanation of Figures 1 to 4

Figure 1: a *Lithophaga hanleyana* (Reeve) sensu GOHAR & SOLIMAN (1963); b *Lithophaga simplex* Iredale; c *Lithophaga kuehnelti* Kleemann, spec. nov., holotype (BM[NH] Reg. No. 1976135); d *Lithophaga lessepsiana* Vaillant (host coral *Stylophora pistillata*, Red Sea), part of BM[NH] Reg. No. 1871.9.8.53; e *Lithophaga lessepsiana* Vaillant (host coral *Heteropsammia michelini*, Lizard Island, GBR). Scale in mm.

Figure 2: The conspicuous incrustation of the posterior end of *Lithophaga kuehnelti*. Scale in mm.

Figure 3: *Acropora (Isopora) palifera* (Lamarck) in situ, showing orifices of burrows. Host coral of *Lithophaga kuehnelti* and rarely of *Lithophaga lessepsiana*.  $\times 1.5$ .

Figure 4: Four specimens of *Lithophaga lessepsiana*; c and d are the same as in Figure 1d and 1e. Scale in mm.

All photographs, except Figure 3, by P. Richens, courtesy of the Trustees of the British Museum (Natural History)



